In his recent paper, Dobson (2005) concludes that, contrary to the work of McHenry and Berger (1998a,b), the pattern of differences in joint proportions between the partial skeleton Stw 431 and A.L. 288-1 “does not correspond to the pattern revealed from a comparison of large samples of unassociated postcranial material from Sterkfontein Member 4 and Hadar” (Dobson, 2005, p. 153). Using exact randomization, he further suggests that Stw 431 and A.L. 288-1 “are not significantly different from each other with regard to limb joint proportions” (Dobson, 2005, p. 153). In his study, Dobson (2005, p. 146) formulates and tests the null hypothesis: “Can the differences between A.L. 288-1 and Stw 431 be sampled from a single species?” In response to Dobson’s conclusions and interpretations of his results, this author would like to raise several additional points that are not adequately elaborated upon by Dobson (2005). These points may offer further insight into the important question of the mode and tempo of the evolution of hominin limb and body proportions, and more specifically on the potentially more ape-like body proportions of *A. africanus*.

One of the principle points of our 1998 series of papers (McHenry and Berger, 1998a,b) was to illustrate that contrary to widely held opinion at the time (McHenry, 1992), we found that *A. africanus* appeared to possess limb joint and, by inference, limb length and body proportions which differed from those of *A. afarensis*, humans, and living apes. We further suggested that the evidence supported a hypothesis that these proportions in *A. africanus* were in fact more ape-like than those observed in *A. afarensis*. We supported these hypotheses by showing how Stw 431 deviated from extant African ape and human regression lines in its joint proportions. In contrast, A.L. 288-1 did not. We also demonstrated that the total samples of hominin upper- and lower-limbs from both Hadar and Sterkfontein Member 4 showed similar patterns to those found in the partial skeletons. These observed patterns were therefore interpreted as being representative of each skeleton’s respective species limb, mass, and body proportions (McHenry and Berger, 1998a,b).

Dobson (2005) argues that our method, when applied to these two early hominin skeletons, however, did not evaluate the probability of sampling the observed differences from within a single species. Dobson (2005) therefore used exact randomization to ascertain whether Stw 431 could belong to the same early hominin species as A.L. 288-1. When comparing elbow to acetabular joint measurements, Dobson (2005) found that the probability of sampling the differences between Stw 431 and A.L. 288-1 from a single species is relatively high (0.18—0.84). Thus, Dobson (2005) interpreted his results that the two partial skeletons could have been sampled in a single species as indicating that they could have originated from a species with the same proportions. It is important to highlight, however, that Dobson (2005) also demonstrates that the differences between the two fossils in proportions of elbow joint size to lumbosacral measurements could not be sampled from within a single species. Specifically, his results illustrate that, insofar as metrics may demonstrate, the sacrum of Stw 431 is ape-like in its relative size as has been previously noted (McHenry and Berger, 1998a,b; Hauesler, 2001). Dobson (2005) additionally notes that this observed difference between
A.L. 288-1 and Stw 431 is most probably representative of A. africanus morphology, in that a relatively reduced sacrum also appears to be present in Sts 14, a partial skeleton which has been attributed to a small, presumed female, A. africanus.

Dobson (2005) nevertheless concludes that although significantly different in certain joint proportions, the upper limb to lower limb joint proportions (and thus presumably limb proportions) of Stw 431 and A.L. 288-1 could be sampled from a single species. This conclusion, however, does not highlight several critical facts that also result from Dobson’s (2005) study and which would, if correct, support our earlier hypotheses. These points are:

1. Stw 431 is more ape-like in its proportions than A.L. 288-1 in all aspects measured by Dobson (2005) and by McHenry and Berger (1998a,b).
2. In all but one joint ratio (humerus distal articular breadth/acetabulum diameter), Stw 431 falls outside of the range of variation observed in humans (note that in even this ratio Stw 431 falls at the extreme limit of measured human variation).
3. Stw 431 falls within chimpanzee ranges in four of Dobson’s (2005) six plots.
4. A.L. 288-1 falls within the human range and outside the chimpanzee range in all joint ratios.
5. Thus, Stw 431 and A.L. 288-1 do differ in both morphology and joint proportions, although less so in elbow/acetabulum proportions than in elbow/sacral proportions.
6. Stw 431 follows the same trend observed in the sample of isolated upper and lower limb elements from Sterkfontein Member 4 (McHenry and Berger, 1998a,b) in possessing more ape-like than human-like proportions.
7. Of the two taxa, A. africanus appears to possess the more primitive (ape-like) joint ratios, which is surprising given that A. afarensis is often hypothesized to have given rise to A. africanus.

It is worth highlighting that in our earlier works we have never suggested that A. africanus possessed limb, joint, or body proportions exactly like those of modern apes; we simply proposed that the species’ proportions were more ape-like than those of A. afarensis. For all of the above points, it is the proportional differences between the sacra and elbows of the two skeletons that exhibit the greatest degree of variation. Other differences are less profound. The morphological basis for these proportional differences between the two species warrants further investigation.

In conclusion, there are, in this author’s opinion, alternatives to Dobson’s rejection of McHenry and Berger’s (1998a,b) earlier hypotheses. One may interpret Dobson’s (2005) results as supporting the central themes of our earlier research in that they add weight to the argument that A. africanus does exhibit more ape-like limb and joint proportions than A. afarensis. Furthermore, it is clear from both Dobson’s (2005) results and our earlier results (McHenry and Berger, 1998a,b) that if A. africanus derives from A. afarensis or a species with similar joint proportions as A. afarensis, then there must be reversals of sorts in body shape in the evolution of hominins. It is, however, this author’s opinion that it is equally likely, as has previously been proposed (Berger, 1998), that A. africanus does not derive from A. afarensis but from a different parent species with more ape-like proportions. Whichever alternative is correct, early hominin body proportions paint a complex evolutionary picture, and Dobson’s (2005) results support this.

Finally, since in Dobson’s (2005) results it was clear from the upper limb/sacral ratios that Stw 431 and A.L. 288-1 exhibited different proportions in certain joint areas, it brings into question whether the exact randomization technique in this case tells us anything at all about patterns in the two hominin species’ body proportions.

References